velop an output since no steep transient is developed in the waveform of FIG. 7B. When the graphic pattern of FIG. 7A is scanned in a direction indicated by the arrow **173**, a mirror image (not shown) of the signal waveform of FIG. 7B is generated.

FIG. 8A illustrates a graphic pattern of a smaller angle **175** included between two edges **177** and **179**. When the graphic pattern of FIG. 8A is scanned in the system by, for example, the horizontal lines **181** through **190** in the direction indicated by the arrow **191**, the photomultiplier **69** develops the signal waveform shown in FIG. 8B. It should be noted that the waveform of FIG. 8B contains a very steep wavefront **135** in the same manner previously described.

The above mechanization for initiating and terminating the angle count for the desired angle measurement has been described for illustrative purposes. The illustrated mechanization, when utilized with the rotational rates and pulse numbers previously cited, would introduce a maximum error of 1 ½°, since the third and fourth additional pulses applied from the threshold detector **109**, after a control pulse is generated, have to be multiplied by the incremental angle (¾°) passed during each of these two pulses.

Alternate methods to initiate the angle counting sequence and to accumulate the necessary angle count are more sophisticated and require the detection of the amplitude of the pulses emerging from the photomultiplier. In this case, the signal conditioner **101** will not correct the amplitude of these pulses but rather, amplify them and process them in such a way that single polarity pulses of varying amplitude emerge from the signal conditioner. These pulses of differing amplitudes are now processed in the following manner.

As one edge of a corner angle to be measured approaches a parallel alignment with the slit **65** a sequence of pulses of increasing amplitude, generated by the photomultiplier **69**, passes a special discriminating circuit, such as a peak detector, without activating the angle count. After that edge of the corner angle reaches and passes a parallel alignment with the slit **65**, a sequence of pulses of decreasing amplitude is generated by the photomultiplier **69**. A predetermined one of the sequence of pulses of decreasing amplitude, such as the first or second pulse after the peak pulse is generated, is sufficient to cause the peak detector to initiate the angle count. A corresponding predetermined pulse for the second edge of the corner angle will then terminate the angle count. This procedure has the advantage that it is truly independent of the statistical fluctuations which occur between the scan and the orientation of either edge of a corner angle so that in the case of two sequential scans straddling the optimum possible alignment of an edge without the slit **65**, the next scan will still automatically initiate (or terminate) the angle count.

It should be noted at this time that the angle measurement of the graphic pattern of FIG. 1 would be made in a manner similar to those described in relation to FIGS. 6A, 7A and 8A, with a very steep transient signal, similar to the wavefront **135**, being developed at the output of the photomultiplier **69** when either of the edges **13** and **15** is in a parallel alignment with the slit **65**.

The invention thus provides an optical system for automatically measuring corner angles of graphic patterns wherein the graphic pattern is illuminated by a light source and the resultant reflected image of the graphic pattern is slowly rotated by a K-mirror assembly and rapidly scanned by a rotating mirror drum past a slit into a detector. In response to the output of the detector and to angle marks from an angle mark generator, a digital processor accumulates the incremental angle count to measure the corner angle of the graphic pattern. Information on the measured corner angle may then be supplied to an output device for viewing or retention of the desired corner angle.

While the salient features of the invention have been illustrated and described it should be readily apparent to those skilled in the art that modifications can be made within the spirit and scope of the invention as set forth in the appended claims.

What is claimed is:

1. An optical system for measuring a corner angle of a graphic pattern, said system having an optical axis and comprising:

first means for causing light images of the graphic pattern to be developed;

second means situated along the optical axis for rotating the light images of the graphic pattern about the optical axis;

third means for repeatedly scanning sequences of incremental portions of each of the light images of the graphic pattern;

fourth means responsive to the sequences of incremental portions being scanned by said third means for detecting first and second edges of the corner angle of each of the light images of the graphic pattern;

fifth means coupled to said second means for generating angle marks; and

sixth means, coupled to said fourth and fifth means, being responsive to the detected first and second edges and the angle marks for generating an output signal corresponding to the corner angle to be measured.

2. The system of claim **1** wherein said second means comprises:

a reflecting prism having the quality of internally reflecting the light images an odd number of times prior to emergence therefrom, said prism being axially aligned on the optical axis; and

seventh means for rotating said prism about the optical axis.

3. The system of claim **1** wherein said second means comprises:

first reflector means situated along the optical axis at a first angle thereto for reflecting the light images of the graphic pattern in a first direction;

second reflector means situated parallel to the optical axis for reflecting the light images reflected from said first reflector means in a second direction;

third reflector means situated along the optical axis at a second angle thereto for reflecting the light images reflected from said second reflector means in a third direction;

housing means for retaining said first, second and third reflector means in fixed positions relative to each other; and

seventh means for rotating said housing means about the optical axis.

4. The system of claim **1** wherein said third means comprises: